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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,140	01/14/2002	Norio Taniguchi	36856.598	6862

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EXAMINER
SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 04/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
10/043,140	Taniguchi
Examiner	**Group Art Unit**
Barbara Summons	2817

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-20 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-19 is/are rejected.

☒ Claim(s) 20 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)–(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)–(d).

☒ All ☐ Some* ☐ None of the:

☒ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO–1449, Paper No(s). 4

☒ Notice of Reference(s) Cited, PTO–892

☐ Notice of Draftsperson's Patent Drawing Review, PTO–948

☐ Interview Summary, PTO–413

☐ Notice of Informal Patent Application, PTO–152

☐ Other _____

Office Action Summary

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 35, line 20, "113b" should be --113B-- (see line 8)[note that inductors have been indicated using lower case letters while bonding wires have been indicated using upper case letters as can be seen in Fig. 1 vs. Fig. 14). On page 37, line 13, "211B" should be --211b--. On page 39, the sentence on lines 6-10 of text, is unclear because there are two inductors 213b1 and 213b2 (Fig. 20) associated with the two bonding wires 213B1 and 213B2 (Fig. 21), so which "inductor" has "about 0.55 nH" is unclear. It appears to be a combination of the two inductors/bonding wires 113B1 and 113B2 since the individual inductors/bonding wires are disclosed later as having inductances of 1.0 nH and 1.3 nH (see pg. 40, the last three lines).

Appropriate correction is required.

Claim Objections

2. Claims 4, 5, 9 and 10 are objected to because of the following informalities:

Claims 4 and 9 are objected to because they are identical. Should claim 9 correctly depend from claim 6?

Similarly claims 5 and 10 are objected to because they are identical. Should claim 10 correctly depend from claim 6?

In each of claims 4 and 9, on the last line thereof, "inductor" should be --inductors-- (see e.g. the last line of claim 12).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ushiroku et al. U.S. 6,137,380.

Figs. 4, 5, and 38 of Ushiroku et al. disclose a surface acoustic wave (SAW) ladder filter circuit 21 comprising: a piezoelectric substrate 22; a plurality of parallel arm resonators (23, 25, 27) and a plurality of series arm resonators (24, 26); a plurality of inductors respectively connected in series to the plurality of parallel arm resonators (i.e. the inductors are the bond wires in Fig. 38 as best seen in Fig. 39); wherein the parallel arm resonators include a first parallel arm resonator (i.e. 23 and/or 27) connected to one of the input and the output of the filter, and a second parallel arm resonator 25 connected to a junction between two series arm resonators; the parallel arm resonators inherently has a capacitance proportionally related a product of the number of electrode finger pairs and the overlap length of the electrode fingers (see other prior art of record as evidence of the inherency), wherein the first parallel arm resonator (e.g. 23) has a capacitance Cp1 proportional to 50 x 60 = 3000 (see col. 7, Table 1) and the second parallel arm resonator 25 has a capacitance Cp2 proportional to 120 x 120 = 14400 so that Cp1 x 2 < Cp2; and wherein the inductor represented by bond wire 155c (Fig. 38), which is connected to the second parallel arm resonator 25 and to package electrode 143c, has an inductance that is

substantially equal to or less than the inductance of the inductors connected to the first parallel arm resonator 23 because bond wire 155c is necessarily shorter than any of the other bond wires connecting the first parallel resonators to the package electrodes (see also claims 3, 8, and 11).

Regarding claims 4, 9, and 12, one end of the second parallel arm resonator 25 is electrically connected to at least two ground electrode pads (143c and 144a). Regarding claims 2 and 7, the resonance frequency of the second parallel resonator 25 [i.e. related to the interdigital transducer (IDT) wavelength see col. 7, Table 1] is lower than the resonance frequency of the first parallel resonator 23 because the IDT wavelength of the second parallel arm resonator is longer. Regarding claims 5, 10, and 13-17, the SAW ladder filter is itself a communication apparatus, and it is a bandpass filter (see e.g. col. 1, lns. 13-14). Regarding claim 6, Cp1 proportional to 3000 and Cp2 proportional to 14400, equates to Cp2 being approximately 4.8 x Cp1, and therefore less than Cp1 x 10. Regarding claims 18 and 19, there are two first parallel resonators 23 and 27 connected to the input and output of the filter device with the second parallel arm resonator 25 disposed between them.

Allowable Subject Matter

5. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or fairly suggest a SAW ladder filter circuit

having each of the specifically recited features and also having the capacitance of the second parallel arm resonator Cp2 equal to 5 x Cp1 (the capacitance of the first parallel arm resonator).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hashimoto U.S. 5,914,646 provides evidence that the capacitance of SAW resonators is proportional to the area of the driving IDT which is proportional to the product of the number of electrode fingers and the electrode finger overlap/aperture length (see e.g. col. 6, lns. 45-48).

Nishihara et al. U.S. 5,909,156 discloses a SAW ladder filter with the center parallel resonator having a capacitance more than two times those parallel resonators connected to the input/output (see col. 8, lns. 15-22 and Figs. 3 and 4).

Ushiroku U.S. 5,999,069 is a U.S. equivalent of JP 11-055067 (cited by Applicant).

Ikada U.S. 6,369,672 also discloses a SAW ladder filter with the center parallel resonator having a capacitance more than two times those parallel resonators connected to the input/output (see col. 5, lns. 38-43 and Figs. 1 and 3), and discloses multiple bond wires connecting the center parallel resonator to multiple package ground pads (see e.g. Figs. 5, 6, 9, and 10).

8. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.

Barbara Summons

Barbara Summons
Primary Examiner
Art Unit 2817

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April 8, 2003